

WHAT IS CLAIMED IS:

1. A lamp comprising:

a hermetically sealed, light transmissive envelope;

a tungsten filament within the envelope; and

5 a mixture of inert gas, a halogen-containing compound, and a silicon-containing compound capable of gettering oxygen within the envelope, wherein the atomic ratio of silicon to halogen is upto about 0.5.

2. The lamp of claim 1, wherein the atomic ratio of silicon to halogen in the mixture is from 0.1 to 0.5.

10 3. The lamp of claim 2, wherein the atomic ratio of silicon to halogen is less than about 0.4.

4. The lamp of claim 2, wherein the atomic ratio of silicon to halogen is from 0.3 to 0.4.

15 5. The lamp of claim 1, wherein the silicon-containing compound is of the general formula $\text{Si}_a\text{H}_{(2a+2-b)}\text{X}_b$, wherein a is an integer greater than zero, b is an integer which has a value between zero and (2a+1), and X is selected from the group consisting of Br, F, Cl, I, and combinations thereof.

20 6. The lamp of claim 5, wherein the silicon-containing compound includes a silane.

7. The lamp of claim 5, wherein the silane is selected from the group consisting of SiH_4 , Si_2H_6 , Si_3H_8 , Si_4H_{10} , and combinations thereof.

8. The lamp of claim 7, wherein b is greater than zero and X is Br.

9. The lamp of claim 1, wherein the inert gas includes a noble gas selected from the group consisting of xenon, argon, krypton, and combinations thereof.

5 10. The lamp of claim 9, wherein the inert gas further includes nitrogen.

11. A method of preparing a lamp comprising:

(a) hermetically sealing an envelope to enclose a fill comprising inert gas, a halogen-containing compound, and a silicon-containing compound, wherein the ratio of silicon to halogen is from 0.1 to 0.5 ; and

10 (b) energizing a tungsten filament within the envelope.

12. The method of claim 11, wherein step (b) follows step (a) without an intermediate step of heating the envelope to activate the silicon-containing compound.

13. A lamp comprising:

15 a hermetically sealed, light transmissive envelope;

a tungsten filament within the envelope; and

20 a mixture of inert gas, a halogen-containing compound, and a silicon-containing compound capable of gettering oxygen within the envelope, wherein the silicon-containing compound is present in a sufficient amount to maintain a lumen per watt efficiency of at least 60% of that of an equivalent lamp formed without a silicon-containing compound.

14. The lamp of claim 13, wherein the lumen per watt efficiency is at least 80%.

25 15. The lamp of claim 13, wherein a lifetime of the lamp is at least 120 % of that of the equivalent lamp formed without a silicon-containing compound.

16. The lamp of claim 1, wherein the silicon-containing compound is of the general formula $\text{Si}_a\text{H}_{(2a+2-b)}\text{X}_b$, wherein a is an integer greater than zero, b is an integer which has a value between zero and (2a+1), and X is selected from the group consisting of Br, F, Cl, I, and combinations thereof.

17. The lamp of claim 16, wherein the silicon-containing compound includes a silane.

18. The lamp of claim 16, wherein the silane is selected from the group consisting of SiH_4 , Si_2H_6 , Si_3H_8 , Si_4H_{10} , and combinations thereof.